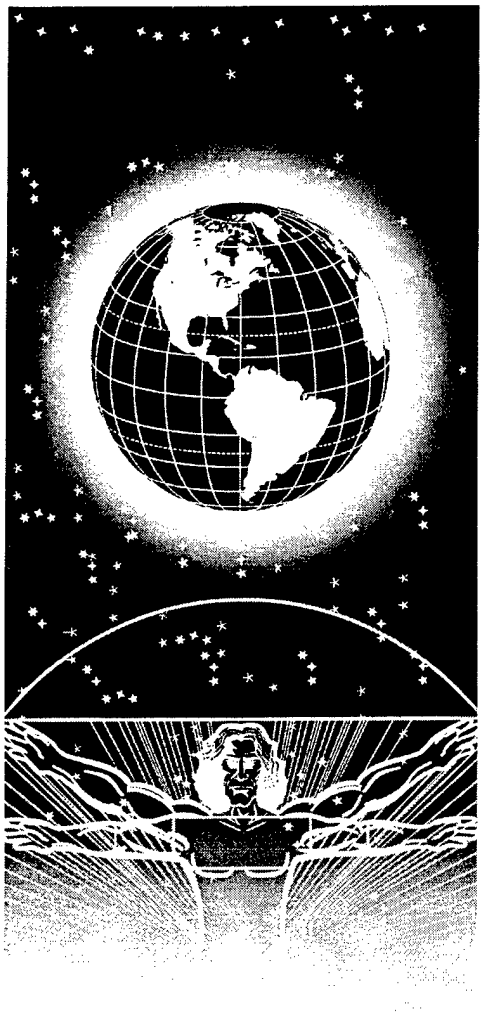
AL/AO-TR-1996-0125



UNITED STATES AIR FORCE
ARMSTRONG LABORATORY

# DESCRIPTION OF THE NEUROPSYCHIATRY BRANCH WITH AN ANNOTATED BIBLIOGRAPHY (JANUARY 1995 - JUNE 1996)

Royden W. Marsh
Neuropsychiatry Branch staff

AEROSPACE MEDICINE DIRECTORATE
CLINICAL SCIENCES DIVISION
NEUROPSYCHIATRY BRANCH
2507 Kennedy Circle
Brooks Air Force Base, TX 78235-5117

October 1996

# NOTICES

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder, or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The Office of Public Affairs has reviewed this technical report, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This technical report has been reviewed and is approved for publication.

ROYDEN W. MARSH
Project Scientist

KENNETH F. GLIFORT, Colonel, USAF, MC, CFS
Chief, Clinical Sciences Division

# REPORT DOCUMENTATION PAGE

*Form Approved*
*OMB No. 0704-0188*



| 1. AGENCY USE ONLY (Leave blank) | 2. REPORT DATE | 3. REPORT TYPE AND DATES COVERED |
|---|---|---|
| | ~~September~~ OCT. 1996 | Interim – January 1995 – June 1996 |

**4. TITLE AND SUBTITLE**
Description of the Neuropsychiatry Branch with an Annotated Bibliography (January 1995 - June 1996)

**5. FUNDING NUMBERS**
PR – 7755
TA – 50
WU – 01

**6. AUTHOR(S)**
Royden W. Marsh
Neuropsychiatry Branch staff

**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**
Armstrong Laboratory (AFMC)
Aerospace Medicine Directorate
Clinical Sciences Division, Neuropsychiatry Branch
2507 Kennedy Circle
Brooks Air Force Base, TX 78235-5117

**8. PERFORMING ORGANIZATION REPORT NUMBER**
AL/AO-TR-1996-0125

**9. SPONSORING/MONITORING AGENCY NAMES(S) AND ADDRESS(ES)**

**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**

**11. SUPPLEMENTARY NOTES**

**12a. DISTRIBUTION/AVAILABILITY STATEMENT**
Approved for public release; distribution is unlimited.

**12b. DISTRIBUTION CODE**

**13. ABSTRACT** (Maximum 200 words)

Monograph contains a directory of the Neuropsychiatry Branch of the Clinical Sciences Division of the Armstrong Laboratory along with an introduction, listing of current or recent projects, educational training activities, operational support, and an annotated bibliography of research products from January 1995 through June 1996.

**14. SUBJECT TERMS**
Aerospace Medicine
Psychiatry
Psychology

**15. NUMBER OF PAGES**
18

**16. PRICE CODE**

| 17. SECURITY CLASSIFICATION OF REPORT | 18. SECURITY CLASSIFICATION OF THIS PAGE | 19. SECURITY CLASSIFICATION OF ABSTRACT | 20. LIMITATION OF ABSTRACT |
|---|---|---|---|
| Unclassified | Unclassified | Unclassified | UL |

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102

CONTENTS

# NEUROPSYCHIATRY BRANCH

Three neuroscience specialties are represented in the Neuropsychiatry Branch of the Clinical Sciences Division: (a) psychiatry, (b) neurology, and (c) psychology/neuropsychology. All share a similar mission: to advance knowledge of central and peripheral nervous system disorders and conditions which adversely impact aircrew in a rapidly changing operational environment.

**Directory:**

Composition of the Neuropsychaitry Branch:
[all individuals can be contacted by e-mail: (lastname)@alaoc.brooks.af.mil or at DSN 240-3537, commercial (210) 536-3537)]

| | |
|---|---|
| Royden W. Marsh, GS-15 | Chief, Neuropsychiatry Branch |
| William E. Drew, LtCol | Chief, Neurology Function |
| John C. Patterson, GM-14(sel) | Chief, Psychology Function |
| Mark D. Sheehan, Maj | Chief, Psychiatry Function and Education and Training |
| Suzanne E. McGlohn, Maj | Chief, Psychiatry Research |
| Raymond E. King, Maj | Matrixed to the Human Engineering Division where he serves as Chief, Crew Station Integration Branch, Wright-Patterson AFB, OH [DSN 785-7556, Commercial (513) 255-; e-mail: SkyKing321@aol.com] |
| Steven C. Caberto, Maj | Neuropsychiatry Branch Research Coordinator; Aerospace Clinical Psychologist |
| Joseph D. Callister, Capt | Officer-in-Charge, Enhanced Flight Screening-Neuropsychiatry (EFS-N); Aerospace Clinical Psychologist |
| Tamara N. Lombard, Capt | Aerospace Clinical Psychologist |
| Lorena A. Bailey, TSgt | Branch Non-Comissioned Officer-in-Charge |
| Gary L. Schofield, TSgt | Psychology Function Non-Comissioned Officer-in-Charge |
| Jacqueline D. Bonney, SSgt | Mental Health Journeyman |
| Pauline M. Etterle, SSgt | Non-Comissioned Officer-in-Charge EFS-N |
| Wilhelmina Y. Cromartie, SSgt | Mental Health Journeyman |
| Sally D. Criollo | Branch secretary |

Our current challenge remains to capture the medical information explosion in the fields of neurology, psychology and psychiatry and apply it usefully to the United States Air Force (USAF) mission of "Global Reach, Global Power." More specifically, the USAF must improve selection techniques for pilot trainees. The USAF must avoid the loss of highly trained, highly skilled, experienced aircrew. And, the USAF must explore and refine the knowledge base and techniques which maintain and enhance the performance of its aircrew.

Our principal tools in furthering these goals are data sets, obtained from operational settings whenever possible, and information from evaluees at the Neuropsychiatry Branch. We are working to streamline and simplify data gathering through the development of computerized psychometric batteries, ambulatory neurologic monitoring, and refined software analysis of "state of the art" neuroimaging studies. Collaboration with multiple university and industry partners

will keep our technology development at the cutting edge and outyear paybacks will be a significant improvement in the ability to create/evolve physical standards evaluation tools and decision rules.

The ability to rapidly obtain psychometric information on a "normative sample" of operational aviators is a key goal of the Aerospace Neuropsychiatric research effort. Once validated, contributions from a self-administered, computerized testbed will identify changing patterns of aircrew psychiatric health. Future collaboration with universities and industry will gain more specific tools to assess aviator neuropsychiatric performance. Updated aircrew selection criteria will help reduce the neuropsychiatric morbidity in skilled aviators, and will capitalize on data gathered from the Enhanced Flight Screening program research. Central nervous system functioning and its contribution to aircrew selection, health, and performance enhancement is the greatest technology/information void of the next decade.

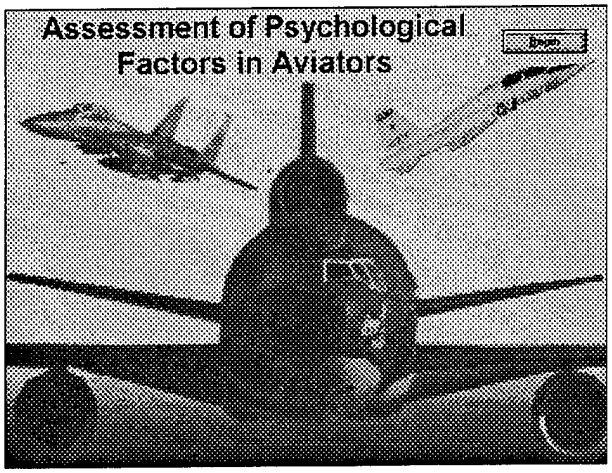
**Projects:**

**Collaborative Study to Assess Cognitive Deficits and Seizure Risks in Aviators with Closed Head Injuries:**

The Collaborative Study to Assess Cognitive Deficits and Seizure Risks in Aviators with Closed Head Injuries is in the final review process for anticipated commencement Oct 96. This ten year study will be conducted in collaboration with The Magnetic Source Imaging Center of the New Mexico Institute of Neuroimaging (Albuquerque NM) and the Research Imaging Center of the University of Texas Health Science Center (San Antonio TX). The study will prospectively follow aviators with closed head injuries to better characterize seizure risks and cognitive deficits which occur with various degrees and patterns of closed head injuries. This will result in a better understanding of the natural history of closed head injuries and the identification of those studies obtainable early following closed head injury which best characterize the extent of injury and the long term prognosis for seizure risk and cognitive deficits. The baseline neuropsychological testing currently conducted on entering aviators in the Enhanced Flight Screening Program will provide critical baseline data on each aviator to compare with results following any head injury which may occur. Any other investigators conducting similar research are encouraged to contact the Principal Investigator. The potential exists to expand and coordinate this research with similar studies to increase the number of participants and produce statistically significant results sooner. Principal Investigator: LTC William E. Drew

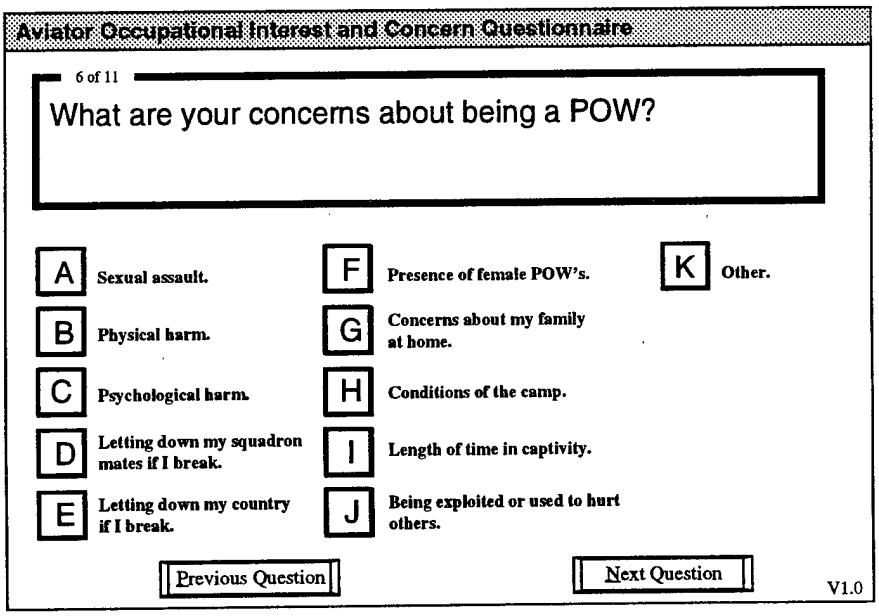
**Spinal Disease in Aviators:**

Spinal Disease in Aviators, especially those flying high performance aircraft, is of concern due to its 1) potential for limiting flying performance, 2) possible contribution to long-term aviator morbidity and 3) ejection safety. Several initiatives are being conducted to better assess and characterize the nature of the problem for the purpose of improving flying performance and aviator safety. Initiatives include: 1) an anonymous aviator survey to better define the problem, 2) a review of waiver files to determine if high-performance aviators have a higher incidence of spinal disease as compared to nonhigh-performance aviators and 3) simulations of ejections of aviators with various spinal diseases using finite element analysis to assess the effect of these diseases on ejection safety. Principal Investigator: LTC William E. Drew.




**Assessment of Psychological Factors in Aviators:**
Majors Suzanne E. McGlohn and Raymond E. King completed the $91K Defense Women's Health Research Program (DWHRP) project entitled *Assessment of Psychological Factors in Aviators*. This protocol used structured interviews to gauge the combat and deployment stressors of rated male and female pilots. The protocol also used computerized psychological testing to study personality and cognitive attributes of male and female pilots.

**Psychological Aspects of Aviators' Success:**
Majors McGlohn and King received a $115K grant from the second iteration of the DWHRP for their protocol entitled *Psychological Aspects of Aviators' Success*; Paul D. Retzlaff from the University of Northern Colorado serves as the co-principal investigator. This protocol uses a computerized survey (see below) to capture data on incoming female and male student pilots who are being assessed as part of the neuropsychiatrically Enhanced Flight Screening (EFS) program.




Example of screen from computerized survey

This protocol also introduced the Armstrong Laboratory Aviator Personality Survey (ALAPS), which is an aviation specific inventory of personality and potential for cockpit resource management. More about ALAPS to follow!

**Enhanced Flight Screening - Neuropsychiatry:**

The Enhanced Flight Screening - Medical (EFS-M) program is an Air Force Medical Operations Agency (AFMOA) effort matrixed to the Armstrong Laboratory to screen student pilots prior to entry into Undergraduate Pilot Training. The psychological portion evaluates all student pilots in order to establish baseline cognitive and personality function. Principal Investigator: Captain Joseph D. Callister. For further information, please refer to the Clinical Sciences Division webpage at http://www.brooks.af.mil/AL/AO/AOC/aoc-home.html.

**Education and Training:**

The Neuropsychiatry Branch staff is involved in education efforts in aviation psychology, psychiatry and neurology. Amongst these efforts we support USAF curriculum for: Residents in Aerospace Medicine, Aerospace Medicine Primary (Flight Surgeons to be), International Flight Medical Officers, medical students, Occupational Medicine, Operational Aeromedical Problems, and Aersospace Physiology. In addition, we play a very active role in the coordination and teaching of the USAF Aircraft Mishap Investigation and Prevention Course. Staff members frequently travel to bases in direct support of squadrons for requested safety briefings such as: Stress Management, Fatigue Countermeasures and Communication Skills to name a few. For more information about these and other courses the Neuropsychiatry Branch is involved in, please contact the Chief of Education and Training, Maj Mark D. Sheehan.

**Operational Support:**

**Air Force Special Operations Command (AFSOC) / Aeromedical Consultation Service (ACS) Selection of Special Duty Aviators:**

Aviator Special Operations (Air Commandos) date back to 1943. Army and Navy Special Operators have had specific psychological selection programs for many years; until recently, USAF Special Operations was the only DoD special operations community without a specific selection program. In May 1990 the US Air Force Special Operations Command (AFSOC) was formed. The new commander (Maj Gen Fister) believed that their missions required select and motivated personnel due to the demands of crew coordination, and night operations. As the Command stated the problem: 1) training failures were expensive, 2) some could complete training but never become mission ready, 3) some individuals were never trusted operationally and 4) in summary, as with many aviation missions, their missions allowed for no errors and yet had very high operations (OPS) tempo. A new selection and orientation program, Commando Look was initiated in 1992 specifically for MH-53 (operational helicopter) Pilots, Flight Engineers and Gunners, as they were determined by the Command as the most ready and the most in need, due to the stressors common to their missions.

In November 1991, their Commander asked the USAF Aeromedical Consultation Service (ACS) to rapidly develop a screening and orientation program. We chose a clinical/research approach

that utilized the many years of experience at the ACS evaluating aviators and National Aeronautics and Space administration (NASA) astronauts to quickly build a research-based program for evaluation that would change and improve as data became available.

After studying other operational and research selection programs, Patterson and Sipes began supervisor and commander interviews in early 1992. Commanders stated they wished to avoid (select out) emotionally immature, self-centered, average applicants who had personal or family instability. They wanted to select (select in ) motivated volunteers who could be good leaders and, when necessary, good followers; who could tolerate the Ops tempo of the MH-53s; who showed personal and family stability; who could function with internal gratification, and, who were operationally imaginative and analytical.

We conducted baseline evaluations on about 60% (83) of current unit members using an evaluation protocol of cognitive (Multidemensional Aptitude Battery), personality adjustment and structure ( Minnesota Multiphasic Personality Inventory-2, NEO-Personality Inventory-Revised, Sentence Completion and semi-structured interview) factors that combined select in and select out components along with interview and testing methods. For the baseline unit members, supervisors identified superior individuals. Within 18 months the first selection cycle was run.

Currently, after evaluating the testing and conducting the interview, the evaluators outbrief the applicant about their suitability and complete rating and summary sheets. The results of the assessment are briefed to the Selection Board and a summary recommendation of Exceptionally Well Qualified (EWQ), Qualified (Q), Qualified with Reservations (Qr), or Disqualified (DQ) is given to the board.

In 12 selection cycles (through Apr, 1996) we have completed 143 evaluations with 28% EWQ, 49% Q, and 23% Qr; none have been found DQ. The selection board has selected 72% of the applicants, and not selected 28%; In addition, 4% of the applicants declined the assignment after they were selected.

We have also conducted a similar screening program for a special access program. Their first selection cycle was run in five months, using a similar operational research plan. Here flyers as well as applicants to any job in the unit are evaluated. In 16 selection cycles, we have conducted 302 applicant assessments (through Feb 96), with 92 baseline assessments. Results similar to those of the AFSOC process have emerged, with about 20% of applicants judged to be of questionable suitability.

General results to date indicate that cognitive scores for applicants are better than baseline members and there are some personality differences between the applicants and baseline unit members. The program has reduced training losses (8 per year before--none since program commencement) and therefore costs. About 20% of applicants are found not suitable by the psychologists (comparable to National Security Agency (NSA) and other similar selection programs). The selection board offered jobs to 76% of applicants; and, 16% of those declined the offer.

The purposes of this operational support research include demonstrating the efficacy of such an approach, developing and maintaining research access to operational flying units, developing normative data on aircrew for clinical and research purposes, developing operationally salient outcome measures for validation of the selection approach and providing a Command data upon which to base potential changes to selection as operational or policy needs arise.

Aircrew selection has a long history in aviation but has never been more critical to readiness and safety. This program provides a testbed for building and testing a wide range of selection processes which can be examined for effectiveness and then systematically changed as needed.

Lessons learned here can be applied to other USAF and Department of Defense (DoD) needs for special occupational requirements.

Future plans include outcome assessment using supervisor ratings and expansion of the program into other flying units (AFSOC C-130s and Air National Guard (ANG) F-16s).

The budget is $80,000 per year for screening and assessing 200 applicants per year.

Investigator: John C. Patterson, PhD

**Annotated Bibliography:**

The Neuropsychiatry Branch of Armstrong Laboratory's Aerospace Medicine Directorate completed 26 published products over the past (Feb 95 to Aug 96 ) year. These products helped aid the USAF in understanding aircrew selection, retention, standards, and gender-related issues in the areas of neurology, psychiatry, and psychology.

Callister, J.D., King, R.E., Lanier, D.C., and Etterle, P. (April 1995). Neuropsychiatrically Enhanced Flight Screening: A pilot baselining and validation effort. In R. S. Jensen & L. A. Rakovan (Eds.), *Proceedings of the Eighth International Symposium on Aviation Psychology* (pp. 1127-1131). Columbus, OH: Ohio State University.

This program screens neuropsychological functioning and personality by using computer-administered testing for baselining and potential selection purposes.

Callister, J.D., King, R.E. and Retzlaff, P. D. (August 1995). *Cognitive assessment of USAF pilot training candidates: Multidimensional Aptitude Battery and CogScreen-Aeromedical Edition.* (AL/AO-TR-1995-0125). Brooks AFB: Armstrong Laboratory.

When evaluating candidates, Multidimensional Aptitude Battery subscale scores and summary intelligence scores were found to be well above average. Data from the new CogScreen (Aeromedical Edition) shows consistent differences between pilot training candidates and commercial pilots across reaction time, accuracy, throughput, and process measures.

Callister, J.D., King, R.E., and Retzlaff P.D. (May 1996). Cognitive abilities and personality characteristics of female Undergraduate Pilot Training (UPT) candidates [Abstract]. *Aviation, Space, and Environmental Medicine*, 67, 688.

How do female UPT candidates compare with their male colleagues? Gender-related differences were found on measures of both cognitive abilities and personality variables.

Callister, J. D. and Retzlaff, P. D. (in press). The USAF's Enhanced Flight Screening Program: Psychological assessment of Undergraduate Pilot Training candidates. *Proceedings of the Aerospace Medical Panel Symposium on Selection and Training Advances in Aviation.* NATO Advosory Group for Aerospace Research and Development.

This paper focuses on the psychological assessment techniques of the EFS program. This data is collected to establish medical baseline, but the process provides an infrastructure for productive longitudinal selection research.

Drew, W.E. (Oct 1995). Evaluation of diseased spinal columns for ejection safety using a finite element model. *Neurological limitations of aircraft operations: Human performance implications.* (AGARD) Koeln, Germany.

Aircraft ejection systems have been designed to accommodate the anthropometrically normal male adult having a normal, nondiseased spinal column. This study suggests that finite element analysis is a potential method for determining ejection safety for an aviator with a diseased or otherwise atypical spine prior to returning him or her to ejection seat aircraft.

Flynn, C.F., McGlohn, S.E., and Miles, R.E. (January 1996). Occupational outcome in military aviators after psychiatric hospitalization. *Aviation, Space, and Environmental Medicine,* 67, 8-13.

The objective was to determine if psychiatric hospitalization precluded a return to occupational status in United States Air Force aviators. Psychiatric hospitalization did not prevent a return to flying status for a majority of these high functioning aviators.

Gnan, M., Flynn, C.F., and King, R.E. (February 1995). *Psychological pilot selection in the U.S. Air Force, the Luftwaffe, and the German Aerospace Research Establishment* (AL/AO-TR-1995-0003). Washington, DC: U.S. Government Printing Office.

As financial resources for the U.S. Air Force (USAF) and the German Luftwaffe (LW) dwindle, reducing attrition from military aviation training becomes vital. The USAF and LW could learn from the strengths and weaknesses of their respective selection programs.

Jones, D.R. (May 1996). Aerospace gender issues: Men and women, or men Vs women? In R.E. King (Chair) Panel. *Female USAF pilots: Similar to, or different from, male USAF pilots?* Aerospace Medical Association (AsMA) 67th Annual Scientific Meeting, Atlanta, Georgia.

Men and women are alike in some respects and considerably different in others; this is a universal human experience. Perhaps the main issue is not gender differences per se, but our perceptions of their existence, and how we choose to react to them, both in the cockpit and out of it.

King, R.E. (April 1995). Developing selection and cockpit assignment criteria based on the experience of NASA (AIAA-95-LS-176), *Life Sciences and Space Medicine Conference,* Houston, Texas.

Choosing among applicants for aviation duty from a pool of high-functioning, accomplished individuals is a difficult task. The data collected by NASA and the USAF may help integrate women and men into teams that function under psychological stress (including sustained interpersonal relations in closed quarters) and other adverse conditions.

King, R.E. (May 1995). Neuropsychiatrically Enhanced Flight Screening (N-EFS). In D.L. Damos (Chair) Panel. *Issues in pilot selection.* Aerospace Medical Association (AsMA) 66th Annual Scientific Meeting, Anaheim, California.

Pilots, due to the complexity of their job demands and unforgiving nature of their working environment, may become involved in mishap medical evaluations, including neuropsychological assessment, to continue flying. Gaining baseline psychological data and validating tests as selection/assignment tools on all pilot candidates may reap multiple benefits.

King, R.E. and Flynn, C.F. (October 1995) Defining and measuring the "right stuff:" Neuropsychiatrically Enhanced Flight Screening (N-EFS). *Aviation, Space, and Environmental Medicine*, 66, 951-956.

United States Air Force (USAF) commanders wish to make better pilot-selection and cockpit-assignment decisions. The wide range of intellectual functioning in pilot candidates argues for baseline data collection to improve future aeromedical decisions.

King, R.E. and Flynn, C.F. (January 1996). Development of techniques to identify individuals with superior potential for situational awareness. *Situational Awareness: Limitations and Enhancements in the Aviation Environment* (AGARD-CP-575). Brussels, Belgium.

Certain cognitive abilities and personality traits may be conducive to the development of situational awareness. Testing results captured prior to commencement of training will be compared to occupational outcome (whether or not the candidate became a mission-ready pilot) to assess their predictive value in the development of situational awareness.

King, R.E., McGlohn, S.E., and Retzlaff, P.D. (April 1996). Assessment of psychological factors in female and male United States Air Force pilots. *Fifteenth Applied Behavioral Sciences Symposium,* Colorado Springs, Colorado.

Studied psychological traits found in 64 male and 50 female nonpsychiatrically referred United States Air Force pilots. While MAB IQ's were near identical for men and women, women were found to have higher scores on three scales of the NEO-FFI. An important potential training issue found on interview may be men's desire to protect women in combat.

King, R.E., McGlohn, S.E., Callister, J.D., Retzlaff, P.D., Flynn, C.F., and Jones, D.R. (May 1996). *Female USAF pilots: Similar to, or different from, male USAF pilots? (Overview).*Panel, Aerospace Medical Association (AsMA) 67th Annual Scientific Meeting, Atlanta, Georgia.

Although female aviators have been an integral part of military aviation since World War II, little is known scientifically about their psychological make-up. Efforts to collect normative data on successful pilots helps define the attributes of successful pilots, and allows a better understanding than is possible when relying on information collected from individuals psychiatrically referred.

King, R.E., McGlohn, S.E., Callister, J.D., and Retzlaff, P.D. (May 1996). Personality and management styles of female and male USAF pilots. In R.E. King (Chair) Panel. *Female USAF pilots: Similar to, or different from, male USAF pilots?* Aerospace Medical Association (AsMA) 67th Annual Scientific Meeting, Atlanta, Georgia.

The framework of the paradigm of the "Right Stuff" rests on a male foundation. Do female pilots bring different personality styles into the cockpit? The female pilots seem to have even more of a "good thing" in terms of positive personality traits.

King, R.E. and McGlohn, S.E. (May 1996). Characteristics of female and male USAF pilots: Selection and training implications. *Selection and Training Advances* (AGARD). Prague, Czech Republic.

The determination of psychological fitness to fly is complicated, particularly when attempting to extrapolate what little we know about male aviators to women. The large numbers of aviators in the United States Air Force (USAF) enable it to do research that may be instructive to other, smaller, air forces.

McGlohn, S.E. and Bostwick, J.M. (Nov/Dec 1995). Sertraline with methylphenidate in an ICU patient. *Psychosomatics,* 36, 584-585.

There are few reports of combining serotonin-specific reuptake inhibitors (SSRI's) and psychostimulants. Nine cases in the literature describe rapid improvement in depression following addition of psychostimulants to fluoxetine.

McGlohn, S.E., King, R.E., and Patterson, J.C. (December 1995). *Outline of neuropsychiatry in aviation medicine, II* (AL/AO TR-1996-0003). Washington, DC: U.S. Government Printing Office.

Manual discusses issues in psychiatry and psychology unique to aerospace medicine including: psychiatric disease in the aviator, selection of aircrew and astronauts, fear of flying, and the personality of the successful aviator. This manual addresses issues not emphasized in the typical psychiatry or psychology text, specifically airsickness, combat stress, aircrew fatigue management, prisoner-of-war experiences, and sequelae of aviation mishaps.

McGlohn, S.E., King, R.E., and Butler, J.W. (May 1996). Health and occupational concerns of male and female USAF pilots. In R.E. King (Chair) Panel. *Female USAF pilots: Similar to, or different from, male USAF pilots?* Aerospace Medical Association (AsMA) 67th Annual Scientific Meeting, Atlanta, Georgia.

Due to the decision to open up almost all United States Air Force jobs to women, identification of the stresses of mixed-gender squadrons, attention to the psychological concerns of pilots in combat, and recognition of the difficulties of balancing a career and family are important in today's USAF flying squadrons to ensure mission effectiveness and safety. The information gained from this study will assist the USAF in understanding and coping with the psychological stresses associated with combat, deployment, and mixed-gender squadrons.

Marsh, R.W. and Holland A.W. (May 1996). Psychological aspects of the MIR-18 joint U.S./Russian mission. In M. Barrat (Chair) *Shuttle-Mir Science Program.* Aerospace Medical Association (AsMA) 67th Annual Scientific Meeting, Atlanta, Georgia.

The psychological impacts on the crew of a "long duration" space mission, in this case MIR-18, begin about the time of selection for the mission. Much was learned and accomplished with this mission and a continuing emphasis on the psychological aspects of space travel is required.

Patterson, J.C. (May 1996). Special duty aviator selection: Cognitive and personality findings. *Selection and Training Advances* (AGARD). Prague, Czech Republic.

Helicopter and fixed wing pilots (79), flight engineers (64), and loadmasters (22) have been evaluated for special aviation duty using cognitive (Multidimensional Aptitude Battery) and personality instruments (Minnesota Multiphasic Personality Inventory-2, NEO-Personality Inventory, Cockpit Management Attitude Questionnaire) as well as interviews; further, examiner predictions of adaptability were collected A description of the special duty selection program and future outcome and validation research are discussed.

Retzlaff, P.D., King, R.E., and Callister, J.D. (July 1995). *Comparison of a computerized version to a paper/pencil version of the Multidimensional Aptitude Battery.* (AL/AO TR-1995-0121) Washington DC: U.S. Government Printing Office.

This study examined the comparability of the Armstrong Laboratory's computerized version and the original paper-and-pencil version of an intelligence test. Single factor and two factor analyses indicated that the computerized version was factorially similar to not only the paper-and-pencil pilot candidate data but also the original construction samples.

Retzlaff, P.D., King, R.E., and Callister, J.D. (August 1995). *USAF pilot training completion and retention: A ten year follow-up on psychological testing.* (AL/AO TR-1995-0124) Washington, DC: U.S. Government Printing Office.

A number of studies have examined the intelligence and personality of pilots. Few, however, have been able to utilize long term follow-up data. No differences were found among the training completions group but a number of consistent personality variables were correlated with length of service.

Retzlaff, P.D., King, R.E., and McGlohn, S.E. (May 1996). Intellectual strengths of female and male USAF pilots. In R.E. King (Chair) Panel. *Female USAF pilots: Similar to, or different from, male USAF pilots?* Aerospace Medical Association (AsMA) 67th Annual Scientific Meeting, Atlanta, Georgia.

Men and women are typically found to have moderately significant differences in their intellectual abilities. There were no significant male/female IQ differences in the population studied. The flying community is atypical of the general population as demonstrated by the high average to superior IQ and small standard deviations due to multiple selection and self-selection forces.

Sipes, W.E. and King, R.E. (April 1995). The United States Air Force psychologist's role in aircraft mishap prevention and investigation, *Eight International Symposium on Aviation Psychology,* Columbus, OH, p. 1401-1402.

Describes the formal course for USAF clinical psychologists to consult on aircraft mishap boards. Delineates a survey sent to graduates of the course.

Voge, V.M., King, R.E., and McGlohn, S.E. (February 1996). *Self-reported aviation concerns of male and female U.S. Air Force and U.S. Army rated aircrew.* (AL/AO TR-1996-0039) Washington DC: U.S. Government Printing Office.

An anonymous survey of all U.S. Army and Air Force rated female aircrew and age/duty matched men covered demographics; aircraft fit and safety; interpersonal relationships; waste disposal; menstruation; personal equipment; prisoner of war (POW) concerns; and women in combat concerns. Men were not convinced women should fly in combat; women overwhelmingly asserted they should.